

Table of contents

Chapter 1. Geometric preliminaries	11
1.1. Connections	12
1.2. Riemannian manifolds, geodesics, harmonic maps, and Yang-Mills fields	24
1.3. Jacobi fields and approximate fundamental solutions	45
1.4. Complex manifolds and vector bundles	50
1.5. Kähler manifolds	59
1.6. The Yang-Mills equation in four dimensions	69
Chapter 2. Some principles of analysis	73
2.1. The continuity method and the heat flow method	73
2.2. Elliptic and parabolic Schauder theory	79
2.3. Differential equations on Riemannian manifolds	82
Chapter 3. The heat flow on manifolds. Existence and uniqueness of harmonic maps into nonpositively curved image manifolds	87
3.1. The linear case. Hodge theory by parabolic equations	87
3.2. Harmonic maps	95
3.3. The heat flow for harmonic maps	99
3.4. Uniqueness of harmonic maps	105
Chapter 4. The parabolic Yang-Mills equation	110
4.1. The parabolic version of the Yang-Mills equation	110
4.2. The Hermitian Yang-Mills equation and its parabolic analogue	114
4.3. Global existence	118
Chapter 5. Geometric applications of harmonic maps	125
5.1. The topology of Riemannian manifolds of nonpositive sectional curvature	125
5.2. Siu's strong rigidity theorem for strongly negatively curved Kähler manifolds	130
Appendix: Some remarks on notation and terminology	147
Bibliography	150